

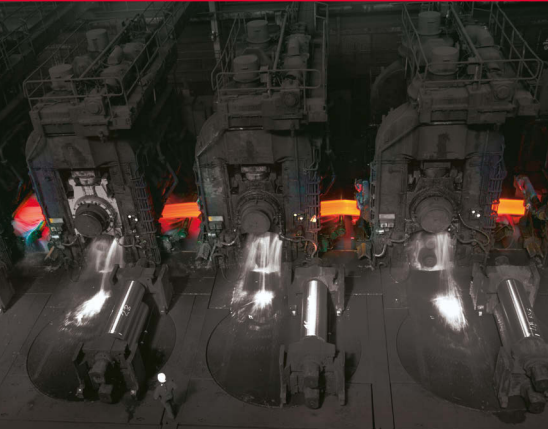
NSK

CYLINDRICAL ROLLER BEARINGS WITH ALIGNING RINGS

LONG-LIFE SOLUTIONS FOR CONTINUOUS CASTING MACHINES



STAY IN MOTION. STAY IN CONTROL.



MADE WITH METTLE

BEARINGS FOR STEEL AND METALS MACHINERY

Massive loads. Intense heat. Ultra low speeds. Staggering shock loads, misalignment, and contamination from mill scale and water vapor.

From iron and steel making through rolling and forming mills, the operating conditions of the entire process are severe. The reliable, uninterrupted performance of rolling components is critical for accelerated production.

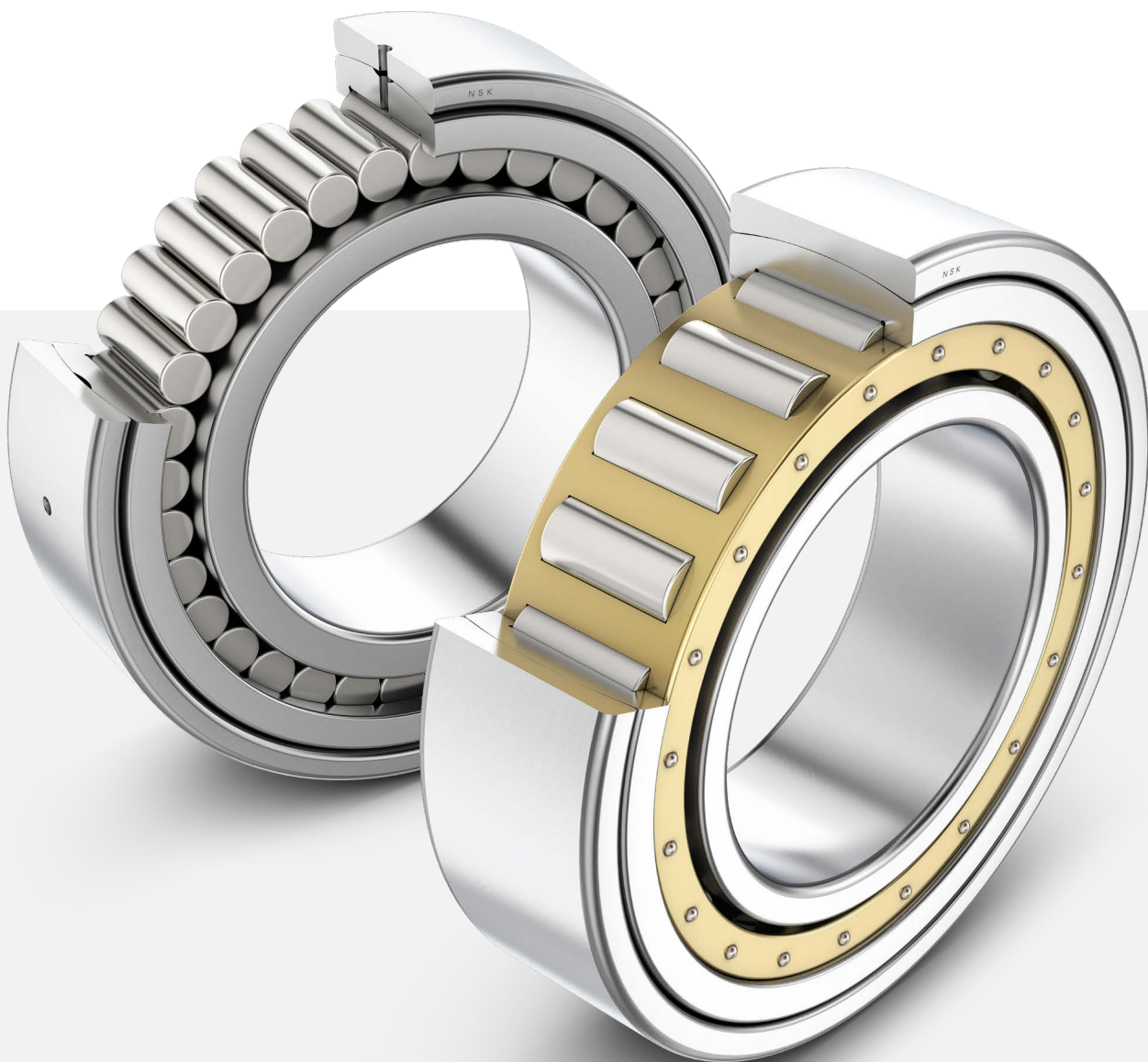
For NSK, our product development and design is focused squarely on withstanding the manifold operating stresses of these applications with:

- › increasing capacities for high loads and high speeds
- › advanced materials for durability, wear resistance and longer life
- › lubrication and seal technology for smooth and clean running

Our product solutions are designed to optimize the performance of machinery and equipment, to assure predictable reliability and to deliver total cost-efficiency.

**OUTSTANDING PERFORMANCE.
ENGINEERED IN.**

Engineered to withstand the heavy loads and low speeds in continuous casting machines, NSK's RUB series are designed to offer a particularly effective solution for the float end of single and split segment guide rolls. RUB bearings accommodate roll extension with smooth axial displacement, and their self-aligning design tolerates misalignment and shaft deflection without impacting performance. They run with reduced sliding friction and wear compared to conventional bearing solutions for a longer, more reliable operating life.



DESIGN AND OPERATING ADVANTAGES

NSK's RUB series cylindrical roller bearings with aligning rings are designed specifically to deliver low wear and long-life performance under the prevailing heavy loads, low speeds, roll expansion and misalignment in continuous casting guide roll applications.



DESIGN FEATURES

- › Single-row cylindrical roller bearing with aligning ring
- › With pin-type brass cage or full complement design options
- › High capacity internal design parameters, with optimal size and number of rollers
- › Optimized roller crowning reduces internal sliding friction and wear while absorbing roll bending
- › Available with / without lubrication holes in the aligning ring, lubrication groove and holes in the outer ring
- › Corrosion resistant phosphate coating option
- › Available with radial internal clearance C-normal, C3 and C4



Smooth axial displacement accommodates free thermal expansion of the roll



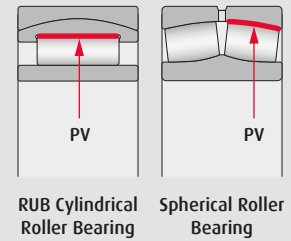
Aligning ring tolerates misalignment and shaft deflection

COMPARISON OF PV VALUE PROPERTIES

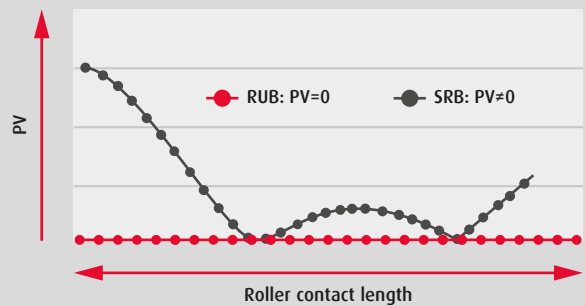
RUB Bearing v. Spherical Roller Bearing

Factors that affect wear within the bearing:

- › Surface pressure (**P**)
- › Sliding (**V**)
- › Wear property parameter (**PxV=PV**)

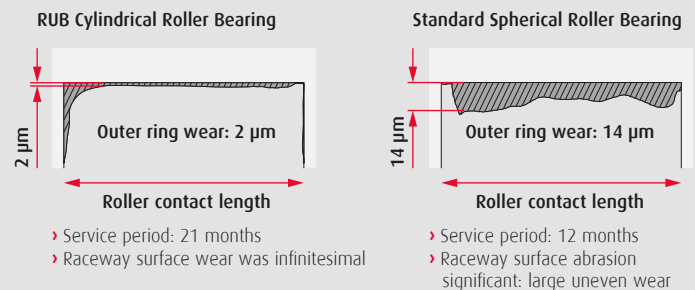


PV value between the outer ring and roller raceway surface



Field Endurance / Wear Evaluation

Inspection of an abrasion level on the outer ring raceway surface

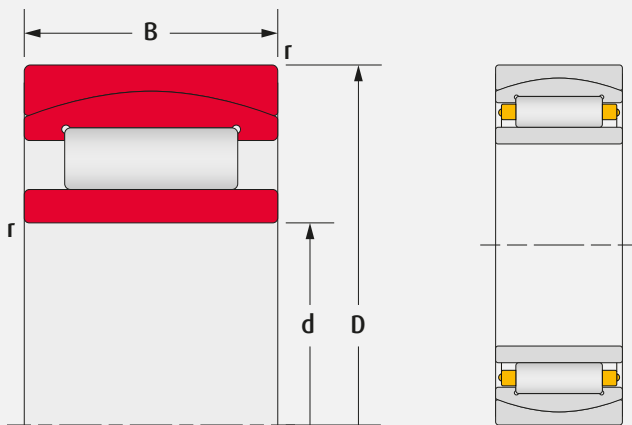


PROVEN ADVANTAGES

- › Extended operating life – preventing wear problems related to differential sliding
- › Smoothly absorbs axial thermal expansion of the roll, eliminating wear to the chock bore surface
- › Self-aligning capability accommodates misalignment and shaft deflection, minimizing the effects of edge loading
- › Full-complement design option for extremely high loads

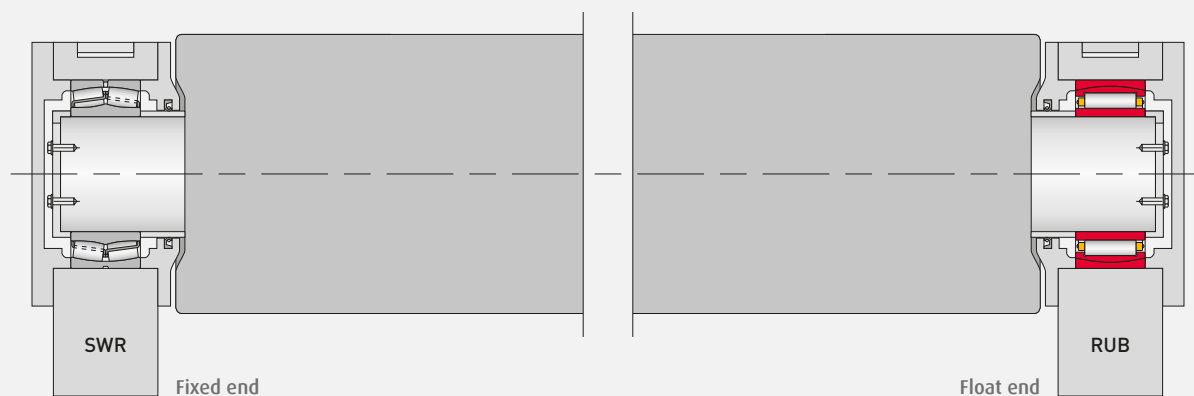
BEARING DIMENSIONS AND OPERATING VALUES

RUB SERIES WITH CAGE



with cage

BASIC BEARING NO.	BOUNDARY DIMENSIONS				BASIC LOAD RATINGS	
	mm				kN	
	d	D	B	r (min)	Dynamic	Static
100RUB31	100	165	52	2.0	221	385
100RUB22		180	46	2.1	251	375
100RUB23		215	73	3.0	435	595
110RUB41	110	180	69	2.0	271	490
120RUB30	120	180	46	2.5	215	415
120RUB40		180	60	2.0	247	495
120RUB41		200	80	2.0	370	680
120RUB32		215	76	2.1	435	735
130RUB41	130	210	80	2.0	380	715
130RUB32		230	80	3.0	490	825
140RUB40	140	210	69	2.0	330	670
140RUB41		225	85	2.1	435	830
140RUB22		250	68	3.0	480	740
150RUB40	150	225	75	2.1	375	755
150RUB41		250	100	2.1	540	1 040
150RUB32		270	96	3.0	690	1 210



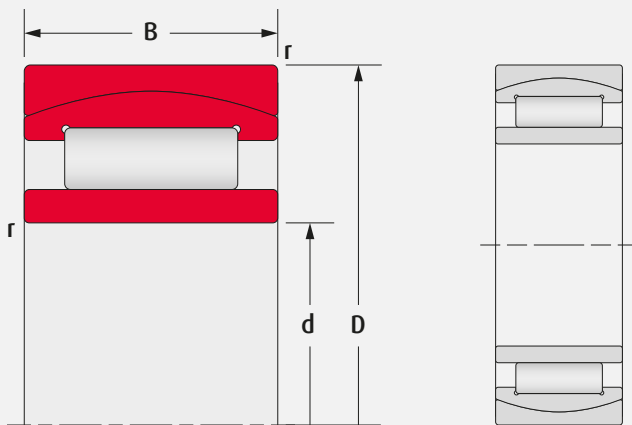
Illustrated: Bearing arrangement for a single drive roll with RUB Cylindrical Roller Bearings used in conjunction with NSK's SWR Spherical Roller Bearings.

BASIC BEARING NO.	BOUNDARY DIMENSIONS				BASIC LOAD RATINGS	
	mm				kN	
	d	D	B	r (min)	Dynamic	Static
160RUB41	160	270	109	2.1	690	1 260
160RUB32		290	104	3.0	795	1 370
170RUB41	170	280	109	2.1	710	1 330
170RUB32		310	110	4.0	915	1 590
180RUB40	180	280	100	2.1	635	1 300
180RUB41	180	300	118	3.0	755	1 460
190RUB41	190	290	100	2.1	650	1 360
190RUB32	190	340	120	4.0	1 050	1 870
200RUB30	200	310	82	2.5	635	1 210
200RUB40		310	109	2.1	770	1 540
200RUB41		340	140	3.0	1 080	2 200

Additional bearing sizes are available. Please contact NSK for additional information.

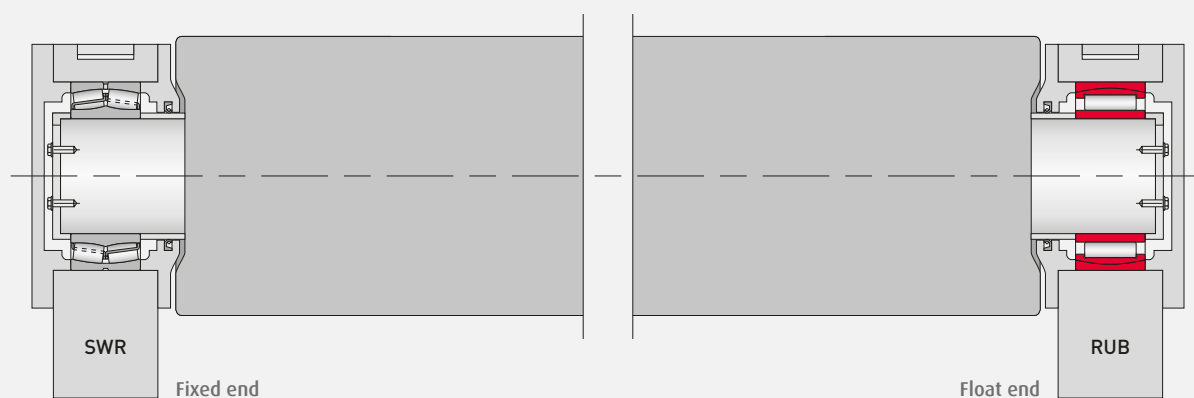
BEARING DIMENSIONS AND OPERATING VALUES

RUB SERIES - FULL COMPLEMENT



full complement

BASIC BEARING NO.	BOUNDARY DIMENSIONS				BASIC LOAD RATINGS	
	mm				kN	
	d	D	B	r (min)	Dynamic	Static
100RUB40APV	100	150	50	2.0	230	530
100RUB31APV		165	52	2.0	272	550
100RUB22APV		180	46	2.1	277	545
100RUB32APV		180	60.3	2.1	360	650
110RUB30APV	110	170	45	2.0	246	565
110RUB40APV		170	60	2.0	300	735
110RUB31APV		180	56	2.5	345	670
110RUB41APV		180	69	2.0	385	835
110RUB22APV	120	200	53	2.5	380	625
120RUB30APV		180	46	2.0	275	625
120RUB40APV		180	60	2.0	330	790
120RUB41APV		200	80	2.5	470	1 040
120RUB32APV	130	215	76	2.1	510	990
130RUB40APV		200	69	2.0	410	955
130RUB31APV		210	64	2.0	415	865
130RUB41APV		210	80	2.0	480	1 050
130RUB22APV	140	230	64	3.0	495	840
130RUB32APV		230	80	3.0	585	1 090
140RUB30APV		210	53	2.0	365	885
140RUB40APV		210	69	2.0	420	990
140RUB31APV	140	225	68	2.1	485	100
140RUB41APV		225	85	2.1	575	1 310
140RUB22APV		250	68	3.0	510	1 110
140RUB32APV		250	88	3.0	670	1 500



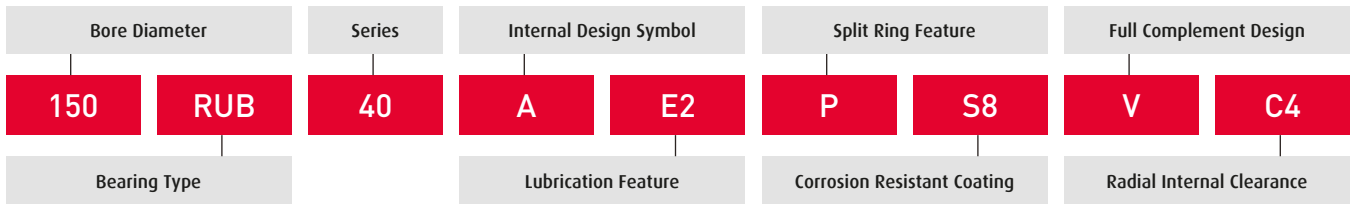
Illustrated: Bearing arrangement for a single drive roll with RUB Cylindrical Roller Bearings used in conjunction with NSK's SWR Spherical Roller Bearings.

BASIC BEARING NO.	BOUNDARY DIMENSIONS				BASIC LOAD RATINGS	
	mm				kN	
	d	D	B	r (min)	Dynamic	Static
150RUB30APV	150	225	56	2.5	390	840
150RUB40APV		225	75	2.1	485	1 210
150RUB31APV		250	80	2.1	595	1 290
150RUB41APV		250	100	2.1	710	1 620
150RUB32APV		270	96	3.0	815	1 640
160RUB40APV	160	240	80	2.1	530	1 330
160RUB41APV		270	109	2.1	855	1 830
160RUB32APV		290	104	3.0	960	1 890
170RUB30APV	170	260	67	2.1	555	1 130
170RUB40APV		260	90	2.1	655	1 580
170RUB41APV		280	109	2.1	875	1 900
170RUB32APV		310	110	4.0	1 060	2 090
180RUB40APV	180	280	100	2.5	785	1 870
180RUB41APV		300	118	3.0	940	2 120
180RUB32APV		320	112	4.0	1 090	2 190
190RUB40APV	190	290	100	2.1	850	2 100
190RUB31APV		320	104	3.0	1 050	2 240
190RUB41APV		320	128	3.0	1 120	2 480
190RUB32APV		340	120	4.0	1 210	2 430
200RUB40APV	200	310	109	2.1	1 030	2 550
200RUB31APV		340	112	3.0	1 160	2 470
200RUB41APV		340	140	3.0	1 340	3 100

Additional bearing sizes are available. Please contact NSK for additional information.

DESIGNATION SYSTEM

CYLINDRICAL ROLLER BEARINGS WITH ALIGNING RINGS



DESIGNATION	ATTRIBUTE
Bore Diameter	expressed in millimeters; available from 110 to 200 mm bore diameters
Bearing Type	RUB single row cylindrical roller bearing with aligning ring
Dimensional Series	32
	40
	41
Internal Design Symbol	A assigned by NSK
Lubrication Features	E1 lubrication holes in the outer rings, lubrication groove in the middle ring
	E2 lubrication holes in the outer rings

DESIGNATION	ATTRIBUTE
Split Ring Feature	blank no split ring feature
	P single split line on outer bearing ring
Coating	S8 corrosion resistant phosphate coating
Full Complement Designation	blank bearing with a cage
	V full complement bearing
Radial Internal Clearance	blank normal clearance
	C3 greater than normal
	C4 greater than C3



IMPROVEMENT PAYS

END-TO-END SERVICE DELIVERS CUSTOMER SUCCESS

Improvement never ends. And we never stop looking for better ways to support our customers in a complete, collaborative and continuous way. The focus of NSK isn't simply on a quick fix for immediate gain – it's about incremental and sustainable improvement to deliver long-term benefits.

When NSK is on-site, we're there to understand our customers' challenges and identify problems contributing to frequent bearing replacement, breakdowns caused by poor specification, high energy costs from inefficient product selection and lost production because of downtime. We collaborate with our customers to institute an **Asset Improvement Program (AIP)** that encompasses process and maintenance management, diagnostic and educational support to deliver measurable gains in output and cost-efficiency.

With NSK, our customers embark on a critical path to realizing improvements in equipment, productivity, people and financial performance.





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